

PROCEEDINGS
OF THE
CALIFORNIA ACADEMY OF SCIENCES
FOURTH SERIES

Vol. XXXV, No. 6, pp. 117-128; 5 figs.

November 22, 1967

SIX NEW SPECIES OF CALLIPHORIDAE AND
SARCOPHAGIDAE (DIPTERA: CALYPTRATAE)
FROM THE ETHIOPIAN REGION

By
F. Zumpt

*Department of Entomology and Parasitology,
South African Institute for Medical Research, Johannesburg*

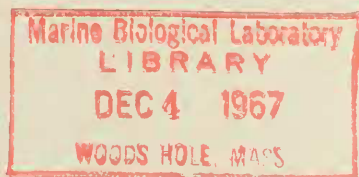
Dr. Paul H. Arnaud was kind enough to entrust me with the study of several hundreds of specimens of Calliphoridae and Sarcophagidae which had been collected by Dr. E. S. Ross and Mr. R. E. Leech during their study in Africa in 1957 and 1958. This material comprised 56 species, of which six species proved to be new to science and will be described further on. Many of the known species are common, and are found nearly everywhere in the Ethiopian region. Some other species are of interest in respect to new localities. It has been decided, however, to leave these new locality records to a later publication which will represent the Sarcophaginae of the Ethiopian region as part IV of my revision of the Calliphoridae and a supplement to the already published parts I to III (Zumpt 1956, 1958, and 1961).

The termini used in the description of the new species are explained in part I of the work mentioned above.

Cosmina upembae Zumpt, new species (Rhiniinae).

Cosmina upembae is superficially similar to *Cosmina undulata* Malloch, however, the wing-cell R_5 is fairly long-petiolate. In my key to the genus *Cosmina* (Zumpt, 1958), it therefore runs down to *Cosmina gracilis*, from which it is separable by the longer petiole of cell R_5 , the dark metallic coloring, the greater body-size, and in the male sex easily by the narrow frons and the structure of the hypopygium (fig. 1).

MALE. Eyes bare, upper facets moderately enlarged and not demarcated from the lower ones. Frons in the middle very narrow, eyes nearly touching each other, frontal stripe in the lower half triangular, red-brown, ocellar triangle black, outer vertical and ocellar bristles distinct. Parafrontalia and parafacialia



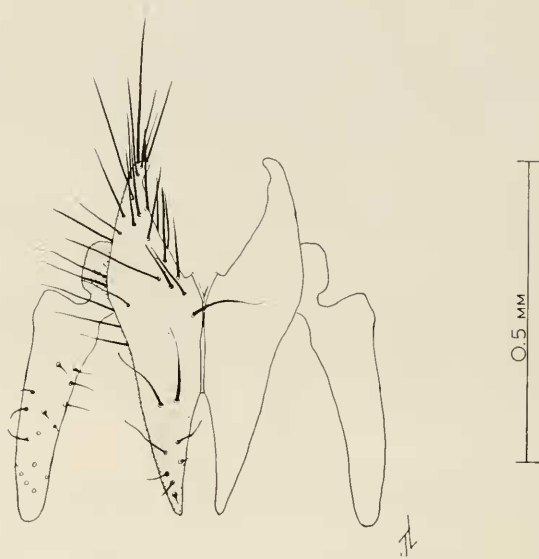


FIGURE 1. *Cosmina upembae* Zumpt, new species. Cerci with paralobi in frontal view.

with a dense white pruinosity, parafacialia in the lower part with a large glossy spot; parafrontal and parafacial bristles accompanied by a few black setae. Antennal groove glossy black and slightly dusted, antennae separated from each other by a relatively narrow prominence which has no dorsal impression and which is flattened just beyond the first antennal segment; arista with hairs on both sides almost reaching the tip. Height of bucca about $\frac{1}{4}$ of eyelength, anterior half glossy black and without pollinosity, posterior half whitish pollinose, with black and pale hairs. Vibrissa long, row of peristomal bristles complete. Palpus black, only its basis more or less extended brown, upper margin straight, the lower symmetrically curved, the greatest width being near the middle of the palpus, almost equalling that of the third antennal segment.

Thorax metallic dark, greenish to coppery with a slight pruinosity; stigmata brown. Presutural acrostichals not developed, and the prescutellar acrostichals as well as dorsocentrals asymmetrically arranged and variable in length; one anterior and two posterior intra-alars, presuturals and outer posthumeral present, two or three humeral, two notopleural, three supra-alars, scutellum with three long marginals and a shorter pair of discal bristles. Pleura with black and pale hairs and a slight white pruinosity, prostigmatic and propleural bristles present, posterior margin of mesopleuron with a complete row of long black bristles, one anterior and one posterior stenopleural, propleuron, suprasquamal ridge and postalar declivity without hairs. Wings strongly tinged and at the anterior margin with a well defined, dark-brown band which covers the costal,

subcostal, and marginal (R_1) cells, and the terminal upper half of the submarginal (R_3). Veins dark and light brown, basicosta blackish, costal spine long, stem-vein with long black bristles, upper basal cross-vein broadly rounded, first posterior cell (R_5) fairly long-petiolate; thoracic squama longer than broad, halter yellow-brown. Legs with dark femora and yellow-brown tibiae and tarsi; fore-tibia with several short anterodorsals and one long submedian posteroventral; mid-tibia with one anterodorsal, two posterodorsals, one anteroventral, and one posteroventral; hind-tibia with several anterodorsals and posterodorsals and one anteroventral.

Abdomen colored like the thorax; longer than broad, hairs and bristles black. Hypopygium very similar to that of *C. undulata*.

FEMALE. Frons at vertex measuring $\frac{4}{9}$ of eye length, frontal stripe red-brown, subparallel, at the tip of the ocellar triangle a little broader than one parafrontalium. Chaetotaxy of head fully developed, parafrontalia white pollinose and with large and densely placed setigerous spots, parafacialia with a large glossy spot and sparse setae as in the male. Palpus about twice as broad as the third antennal segment.

LENGTH: 8 to 9 mm.

LOCALITY. Munowe, Park Upemba, Congo, 1450 m., 18 January 1958; (2 ♂, 1 ♀, collected by E. S. Ross, and R. E. Leech. The male paratype has been presented to the South African Institute for Medical Research, Johannesburg.)

***Hoplocephalopsis rossi* Zumpt, new species (Miltogramminae).**

This species is very similar to *Hoplocephalopsis schistacea*, and at first I thought them to be conspecific. Unfortunately, the structure of the hypopygium is not of much help in this and related genera, but some other features which seem to be constant allow a separation from *H. schistacea*. These features concern the density of the pruinosity on the parafrontalia and parafacialia, which is thicker in *H. schistacea* and visible at any angle of light-incidence. Furthermore, the thorax is also densely gray pollinose and four narrow longitudinal black lines are clearly visible on the presutural area. The palpi of *H. schistacea* are reddish to brown, but black in the new species, there are three to five pairs of fronto-orbitals in *H. schistacea* and only one posteroventral on the fore-tibia.

MALE. Eyes with small facets, densely haired. Frons at its narrowest point (near vertex) measuring about half ($\frac{7}{12}$) of eye length. Profrons $\frac{1}{3}$ as broad as the eye is long. Parafrontalia and parafacialia glossy black, with a weak grayish pruinosity, which is only visible under a certain angle of light-incidence. Frontal stripe red-brown, subparallel. Bristles long and thick, ocellars divaricate, outer verticals only a little shorter than the inner verticals, frontals reclinate and close to the proclinate fronto-orbitals (five to six pairs), row of parafacial bristles consisting of six to seven pairs, of which the last three are reclinate;

remaining part of parafrontalia and parafacialia densely beset with long black hairs which become thinner towards the vertex. Inner margin of parafacialia with a row of bristles which are clearly distinguished by their thickness from the normal hairs. Antennal groove deep black, with a dense white to yellow pollinosity; antennae black, only the posterior margin of the second segment red-brown, third segment only slightly longer than the second; arista with a microscopic pilosity, thickened in the basal fourth. Vibrissarium red-brown, vibrissa long and thick, facial ridge above it with a few bristles, row of peristomal bristles complete, bucca $\frac{1}{3}$ as high as the eye is long, densely gray pollinose, with black hairs. Palpi black, slender, slightly bent.

Thorax black, with a weak shine and a thin yellow-brown pruinosity visible only at a certain angle of light-incidence; longitudinal narrow dark lines on the presutural area quite indistinct. Bristles long, no anterior and one posterior acrostichal, two anterior and three posterior dorsocentrals, no anterior and two posterior intra-alars, two to three presuturals, posthumeral present, three humeral, two notopleurals, two supra-alars. Scutellum with three pairs of long marginal and one or two pairs of discal bristles. Pro- and poststigma dark brown. Propleuron with a few single setae in the upper part, which may be completely wanting or are asymmetrically developed; propleural and prostigmatic bristles are accompanied by several bristly hairs; two anterior, one middle, and one posterior sternopleurals, prosternum and alar declivity bare. Wing hyaline, basicosta yellow, epaulet black. Costal spine distinct. Cell R_5 closed, media with a right angle. Thoracic squama broad, white, and with a narrow yellow margin. Legs totally black; fore-tibia with a row of anterodorsal bristles and two submedian posteroventrals; mid-tibia with four to six anterodorsals which gradually increase in length towards the tarsus; furthermore two posterodorsals, one anteroventral and one posteroventral are present; hind-tibia with a row of anterodorsals arranged as in a comb, with three or more posterodorsals and a submedian anteroventral. Tarsi and pulvilli normal.

Abdomen longer than broad, reddish with a black pattern and a white pollinosity as in *H. schistacea*. Hypopygium is seemingly not separable from that of *H. schistacea*.

FEMALE. General appearance as in *H. schistacea*, but frons at vertex about as broad as one eye is long. Third antennal segment about $1\frac{1}{2}$ as long as the second. Fore-tibia with two posteroventrals as in the male, whereas only one posteroventral is present in the female of *H. schistacea*.

LENGTH: 12 mm. to 13 mm.

LOCALITY. Ten miles southwest of Quirimbo, Angola, 180 m., 1 June 1958, 5 ♂♂ and 3 ♀♀, collected by E. S. Ross and R. E. Leech. Two paratypes ♂♂ and one paratype ♀ have been kindly presented to the South African Institute for Medical Research.



FIGURE 2. *Sarcophaga furcoides* Zumpt, new species. Hypopygium in lateral view and outline of cerci dorsally.

***Sarcophaga furcoides* Zumpt, new species (Sarcophaginae).**

This species belongs to the *Sarcophaga angelicae*-group (Zumpt, 1951) and is related to *Sarcophaga furcadorsalis* Rohdendorf. The structure of the hypopygium (fig. 2) allows an easy recognition. The phallus (compare Zumpt and Heinz, 1950) is compact and terminates in three hook-like appendages which are accompanied by a pair of lateral lobes.

MALES. Head silvery pollinose, frontal stripe black, widened towards the antennal groove, and there about one third broader than near the tip of the ocellar triangle. Frons at its narrowest point measuring about $\frac{1}{4}$ of eye length; one parafrontalium is at this point half as wide as the frontal stripe. The parafrontal and parafacial bristles reach the posterior edge of the second antennal segment; inner verticals, frontals, and ocellars well developed, outer verticals indistinct. Parafrontalia and parafacialia with an irregular row of hairs near the eye margin, the terminal three bristle-like. Height of bucca about $\frac{1}{3}$ of eye length, pollinosity gray. Antennae black, third segment twice as long as the second. Palpi black.

Thorax black, olive and gray pollinose, with the usual longitudinal stripes on the notum. Prescutellar pair of acrostichals wanting or only weakly developed; three presutural and four postsutural dorsocentrals, the postsutural ones increasing in size toward the scutellum; two marginal and one discal scutellar on each side, but discals very close to the margin; three sternopleurals in a



straight line. Propleuron densely setulose, propleural and prostigmatic bristles strongly developed and accompanied by several bristly hairs. Wing hyaline, epaulet black, basicosta yellow, veins brown, r_1 dorsally in the anterior half with a dense row of black setae, r_{4+5} with setae half-way to $r-m$. Legs blackish, tibiae partly reddish, fore-tibia with two or three anterodorsal bristles in the upper half, and a submedian posteroventral; mid-femur ventrally with strong bristles, mid-tibia with a submedian anterodorsal, three to four posterodorsals, and a submedian posteroventral and anteroventral, ventral hairs short; hind-femur ventrally with long hairs and a few bristles, hind-tibia with long hairs surpassing the tibial diameter on both edges of the ventral side, and a submedian posteroventral, dorsal side with two long posterodorsals and several anterodorsal bristles of different lengths.

Abdomen black, pollinose like the thorax and with the usual chess-board pattern. Tergite III without a pair of median marginal bristles. Genital segments reddish, the first at the posterior margin with a few bristles, but their length and thickness varies in the specimens before me.

LENGTH: 6 to 10 mm.

LOCALITY. Twenty-seven miles northeast of Kisumu, Kenya, 1650 m., 29 November 1957 (δ , holotype); and 16 miles west of Bururi, Urundi, 8 January 1958 (1 δ , paratype). Both specimens collected by E. S. Ross and R. E. Leech, holotype in the collection of the California Academy of Sciences, paratype in the South African Institute for Medical Research, Johannesburg.

From the British Museum of Natural History, London, the following material has been received and is labelled as paratypes:

Bwamba, Kenya, July and August, 1948 (1 δ , collected by van Someren).

Nairobi, Kenya, July, 1930 (δ , collected by van Someren).

Amani, Tanzania, November, 1921 (1 δ , collected by A. H. Ritchie).

Sarcophaga dewulfi Zumpt, new species (Sarcophaginae).

Of this species, I had already received one specimen from the Congo and named it provisionally, *S. dewulfi* after its collector. There are now two more specimens before me, collected by Ross and Leech, which are labelled as paratypes.

MALE. Head silvery pollinose, frontal stripe black, widened towards the antennal groove, and there a little less than twice as broad as near the tip of the ocellar triangle. Frons at its narrowest point measuring about $\frac{1}{4}$ of eye length; one parafrontalium is at this point half as wide as the frontal stripe. The parafrontal and parafacial bristles almost reach the posterior edge of the second antennal segment; inner ventrals, frontals, and ocellars well developed, outer vertical bristles indistinct. Parafrontalia and parafacialia with an irregular row of hairs near the eye-margin, the terminal three near the vibrissarium bristle-like. Height of bucca a little more than $\frac{1}{3}$ of eye length, densely gray pollinose,

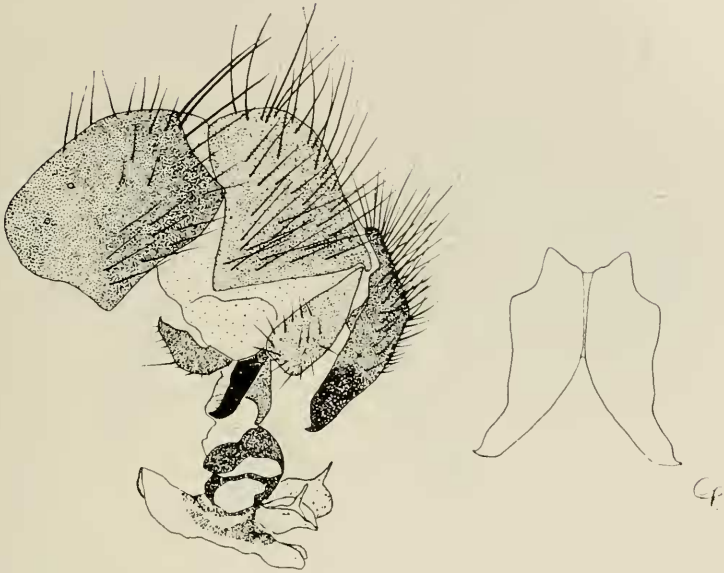


FIGURE 3. *Sarcophaga dewulfi* Zumpt, new species. Hypopygium in lateral view and outline of cerci dorsally.

predominantly with black hairs, post-bucca with pale ones. Antennae black, third segment twice as long as the second. Palpi black.

Thorax black, olive, and gray pollinose, with the usual longitudinal stripes on the notum. Prescutellar pair of acrostichals not developed; three presutural and four postsutural dorsocentrals, the postsutural ones increasing in size toward the scutellum; three postsutural intra-alars but the anterior one weak, presuturals present, two posthumeral, three humeral, four notopleural, two postalar, three marginal and one discal scutellar on each side, but discals very close to the margin, three sternopleurals in a straight line. Propleuron with dense setae, propleural and prostigmatic bristles strongly developed, accompanied by several bristly hairs. Wing hyaline, but with a brownish tinge, epaulet black, basicosta yellow, veins dark brown, r_1 dorsally in the anterior half with a dense row of black setae, r_{4+5} with a similar one which nearly reaches $r-m$. Legs predominantly black, but tibiae partly reddish brown; fore-tibia with three anterodorsals in the upper half, and a submedian posteroventral; mid-femur ventrally with strong bristles, mid-tibia with one submedian anterodorsal, two posterodorsals and a submedian posteroventral and anteroventral, ventral hairs short; hind-femur ventrally with long hairs and a few bristles, hind-tibia with long hairs surpassing the tibial diameter on both edges of the ventral side, and a submedian posteroventral, dorsal side with two long posterodorsal and several anterodorsal bristles of different lengths.

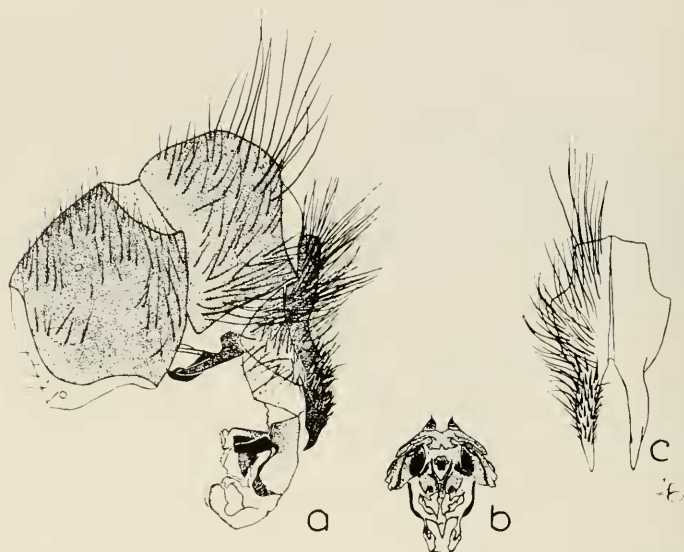


FIGURE 4. *Sarcophaga leechi* Zumpt, new species. (a) Hypopygium in lateral view, (b) terminal part of phallus anteriorly, (c) cerci dorsally.

Abdomen black, pollinose like the thorax and with the usual chessboard pattern. Tergite III without a pair of median marginal bristles. Genital segments reddish, the first at the posterior margin with six long, thick bristles; phallosome of outstanding structure, terminally broad and plough-like (fig. 3).

LENGTH: 8 mm.

LOCALITY. Eighteen miles northwest of Chipinga, Rhodesia, 800 m., 19 March 1958; and 27 miles northeast of Kisumu, Kenya, 1650 m., 29 November 1957 (1♂ each, paratypes, collected by E. S. Ross and R. E. Leech. Specimen from Kenya in the collection of the South African Institute for Medical Research, Johannesburg).

Kibati, N. Kivu, Congo, October, 1933 (♂, holotype, collected by DeWulf, in Musée Royal de l'Afrique Centrale, Tervuren).

Sarcophaga leechi Zumpt, new species (Sarcophaginae).

Sarcophaga leechi is related to *S. freyi* Zumpt. The hypopygium also has slightly undulating curved cerci which are dorsally provided with thick thornes, the phallosome shows shorter and broader appendages (fig. 4) which in number and arrangement, however, correspond with those of *S. freyi*.

MALE. Head silvery pollinose, frontal stripe black, distinctly widened towards the antennal groove and here twice as broad as near the tip of the ocellar triangle, frons at the narrowest point $\frac{1}{3}$ the length of the eye and one parafrenalium is as wide as the frontal stripe. Row of parafrenals and parafacials

complete and nearly reaching the hind edge of the second antennal segment; inner vertical, ocellar, and frontal bristles long and thick, parafrontalia and parafacialia with hairs which gradually increase in size towards the bucca and which form an irregular double row on the parafrontalium and a single one on the parafacialium. Bucca about $2\frac{1}{2}$ times as high as the eye is long, densely beset with black hairs, postbucca with long white hairs. Antennae black, third segment about twice as long as the second. Palpi slender, black.

Thorax cinerous pollinose, with three longitudinal blackish stripes on the notum. Prescutellar pair of acrostichals well developed, three presutural and four postsutural dorsocentrals, one presutural and two postsutural intra-alars, one presutural and two posthumeral, three humeral, four notopleural, three sternopleural in a straight line, three marginal and one discal scutellar on each side and propleural and prostigmatic bristles long and thick. Propleuron bare. Wing hyaline, epaulet black, basicosta yellow, veins dark brown, costal spine well developed, r_1 bare, r_{4+5} with a row of setae which nearly reach $r-m$. Legs black; fore tibia with three anterodorsals in the upper half, and a submedian posteroventral; mid-femur ventrally in the terminal part with two dense rows of short bristles forming a ctenidium, and with longer and irregular bristles and hairs in the anterior two-thirds of the femur, mid-tibia on the inner side with short hairs only and with two anterodorsals and one posterodorsal, one anteroventral, and one posteroventral each; hind-femur ventrally with long bristles and hairs, hind-tibia on the inner side with dense long hairs surpassing the tibial diameter and a long submedian anteroventral, dorsal side with several anterodorsals and posterodorsals of different lengths.

Abdomen with the usual chess-board pattern, segment III with a weak pair of median marginal bristles. Genital segments reddish, the first with strong marginal bristles.

LENGTH: 9 mm.

This description is based on the holotype from Rhodesia. There is a second specimen from Zambia before me which shows no differences in respect to the structure of the cerci and the phallosome. The first genital segment, however, is provided with several strong bristles near the posterior margin, and the abdominal tergite III has no median marginal bristles. The body measures 12 mm. I believe that this specimen is conspecific with the holotype, but have not labelled it as a paratype.

LOCALITY. Twelve miles south of Chipunga, Rhodesia, 970 m., 19 March 1958 (1♂, holotype). Eight miles southwest of Ndola, Zambia, 1310 m., 9 February 1958 (1♂).

Sarcophaga paralina Zumpt, new species (Sarcophaginae).

Sarcophaga paralina is closely related to *S. alina*, the structure of the hypopygium (fig. 5), however, allows an easy separation.

MALE. Head silvery-yellow pollinose, frontal stripe black, widened towards

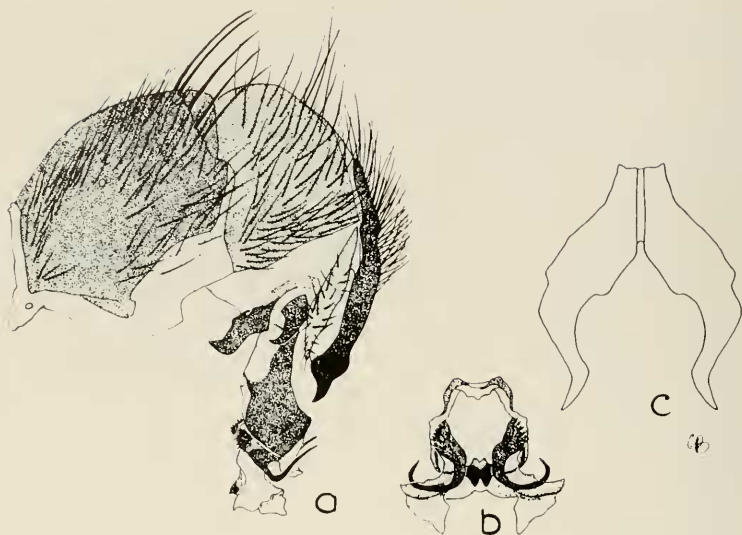


FIGURE 5. *Sarcophaga paralina* Zumpt, new species. (a) Hypopygium in lateral view, (b) terminal part of phallus anteriorly, (c) outline of cerci dorsally.

the antennal groove and there $1\frac{1}{2}$ times as broad as at the tip of the ocellar triangle. Frons at its narrowest point about $\frac{1}{3}$ of eye length, and one parafrontalium here measures about $\frac{1}{2}$ of the frontal stripe. The row of parafrontal and parafacial bristles is complete and reaches the posterior edge of the second antennal segment: inner vertical and frontal bristles, well developed, ocellars short. Parafrontalia and parafacialia with setae, and the latter with three long bristles near the lower eye-margin. Height of bucca $\frac{1}{3}$ of eye length, gray pollinose, in the anterior part with short black hairs, posteriorly with long pale ones. Antennae black, third segment $2\frac{1}{2}$ times as long as the second. Palpi black.

Thorax black, gray and olive pollinose and with the usual longitudinal stripes. All acrostichals completely wanting, two presutural and four postsutural dorso-centrals and strongly diminishing in size toward the head, one presutural and three postsutural intra-alars, three marginal and one discal scutellar, three stenopleurals in a straight line. Propleuron densely setulose, propleurals and prostigmatics long and thick and accompanied by bristly hairs. Wing hyaline, with a brown tinge, epaulet black, basicosta yellow, veins black-brown, r_1 dorsally bare, r_{4+5} with a row of setae halfway to $r-m$. Legs black, tibiae more or less red-brown, fore-tibia with two anterodorsals in the upper half and a submedian posteroventral; mid-femur ventrally with long hairs and bristles, mid-tibia with two posterodorsals and one anterodorsal, one anteroventral, and one posteroventral, ventral hairs short; hind-femur with long hairs and bristles ventrally, hind-tibia with

long hairs surpassing the tibial diameter on both ventral edges, a submedian posteroventral, dorsal side with two long posterodorsals and several anterodorsal bristles of different lengths.

Abdomen with the usual gray and black chess-board pattern. Tergite III with a pair of strong median marginal bristles. Genital segments reddish, the first with a row of black bristles near the posterior margin.

LENGTH: 12 mm.

LOCALITY. Kaimosi Mission, 27 miles northeast of Kisumu, 1650 m., Kenya, 29 November 1957 (1 ♂, collected by E. S. Ross and R. E. Leech).

ACKNOWLEDGMENTS

I wish to thank Professor J. Gear, director of the South African Institute for Medical Research, Johannesburg, for providing the necessary research facilities, and Mrs. Evelyn Nesbitt and Mr. J. Ledger for preparing the drawings.

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